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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KORNAKOV, MICHAEL

ART UNIT

PAPER NUMBER

1746

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/779,839

Applicant(s)

NAGAMURA ET AL.

Examiner

Michael Kornakov

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/504,728.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

1. Claims 1-7 and 15 are pending in the Application.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-7 and 15 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 10 and 11 of U.S. Patent No. 6,277,205. Although the conflicting claims are not identical, they are not patentably distinct from each other because both the instant claims and claims of US'205 disclose a method of cleaning a photomask, comprising:

a step of cleaning a surface of a photomask to decompose organic objects present thereon and to remove metallic impurities;
a step of removing foreign objects attached to the surface of said photomask with cathodic water; and
a step of drying said photomask.

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Claim 11 of US'205 introduces a limitation that cathodic water to be used in said third step contains ammonia.

Although the process claimed in US'205 includes additional steps compare to that instantly claimed, the transitional phrase "comprising" in the instant claim 1 is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997).

The instant Application and U.S'205 are currently commonly owned, have different inventive entities, but there is no showing of common ownership at time of Applicant's invention.

4. Commonly assigned U.S. Patent 6, 277,205, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee is required under 37 CFR 1.78(c) and 35 U.S.C. 132 to either show that the conflicting inventions were commonly owned at the time the invention in this application was made or to name the prior inventor of the conflicting subject matter. Failure to comply with this requirement will result in a holding of abandonment of the application.

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See also OG Notice of 12/26/01 "Guidelines Setting Forth a Modified Policy the Evidence of Common Ownership, or an Obligation of Assignment to the Same Person, as Required by 35 U.S.C. 103(c)" which states:

"Applications and references (whether patents, patent applications, patent application publications, etc.) will be considered by the examiner to be owned by, or subject to an obligation of assignment to the same person, at the time the invention was made, if the applicant(s) or an attorney or agent of record makes a statement to the effect that the application and the reference were, at the time the invention was made, owned by, or subject to an obligation of assignment to, the same person."

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-7, and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites three steps and emphasizes an order of those steps, however it is unclear how the step (2), which recites "removing foreign matter", is different from step (1), which recites "removing organic matter and metal impurities", because the term "foreign matter" **incorporates both** "organic matter and metal impurities". Clarification and correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

8. Claims 1-3, 5-7 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Nagamura et al. (U.S. 6, 277,205 B1), or 102 (a)/(e) as being anticipated by divisional U.S. Patent 6,071,376 to Nagamura. Since both Patents have identical disclosure, only U.S.'205 will be discussed below.

With regard to claims 1 and 15 Nagamura discloses a photomask cleaning method which is highly effective in removing residual sulfuric acid or foreign objects and can remove foreign objects effectively without fluctuating the transmission or other properties of the light-shielding layer (MoSiON film) in a phase shift photomask.

A method of cleaning a photomask comprises the following steps in recited order:

- a step of cleaning the surface of a photomask used as a master with a hot mixture of sulfuric acid and hydrogen peroxide to **decompose organic objects**

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present thereon and remove metallic impurities, which is identical to step 1 of the instant claim 1;

- a step of removing **foreign objects** attached to the surface of said photomask,
- a step of drying said photomask,

(see abstract, Fig.7, col.3, lines 20-48, claims 10, 11).

The cathodic water of Nagamura is the one obtained by applying voltage between the anode the cathode and having a value high enough to **produce hydrogen** (H_2), which is dissolved in water (compare to H_2 gas dissolved water, as instantly claimed).

With regard to claims 2 and 3, the cathodic water to be used in Nagamura is a solution which has a concentration of an ammonia not more than 1% (col. 4, lines 1-5 and 43-47).

With regard to claims 5 and 6 Nagamura teaches that in a method of cleaning a photomask at least **one of said steps** involves ultrasonic treatment as well (col. 4, lines 12-15).

With specific regard to claim 7 Nagamura teaches that the use of **cathodic water comprising a slight amount of ammonia incorporated therein** makes it possible to provide a marked improvement in the percent removal of foreign particulate objects from the surface of a photomask (col. 9, lines 10-15). FIG. 6, for example, illustrates the percent removal of particulate alumina determined when MoSiON film having **particulate** alumina attached thereto.

Therefore all the limitations of the instant claims 1-3, 5-7 and 15 are expressly met by Nagamura.

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Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 1-7 rejected under 35 U.S.C. 103(a) as being unpatentable over Yeol et al (U.S. 6,039,815).

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Yeol discloses a cleaning method employed for removing contaminants adhering to surfaces of substrates and the like during processes for manufacturing liquid crystal display substrates or semiconductors (col.1, lines 5-10).

The method of Yeol comprises providing a cleaning apparatus, dissolving at least one of said ozone gas and **hydrogen gas into pure water** to produce at least one of ozone water and hydrogen water; mixing said ozone water with said acidic solution to form an oxidizing acidic cleaning solution; mixing said hydrogen water with an alkaline solution to produce at least one alkaline cleaning solution; and cleaning a subject to be cleaned with oxidizing acidic cleaning solution and subsequently performing the cleaning with hydrogen alkaline reducing cleaning solution (col. 2, lines 43-67, col. 3, lines 1-10, lines 40-50, claims 1-3). After cleaning is performed the cleaned substrate is dried (col. 9, lines 58-62). This reads on the three step cleaning process, as instantly claimed.

In Yeol, the cleaning efficacy can be improved by combining the above methods on either step with ultrasonic-waves (col.3, lines 45-50). The pH of hydrogen reducing alkaline solution can be adjusted by different alkaline solutions, such as NH₄OH and KOH.

While teaching a cleaning method for removing contaminants from surfaces of substrates and the like during processes for manufacturing liquid crystal displays or semiconductors, Yeol does not specifically indicates cleaning of fotomasks. However, because Yeol provides effective cleaning of surfaces of **different** substrates, utilized in semiconductor processing, and indicates that a plurality of types of contaminants can be

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removed from such surfaces (col.2, lines 43-49), one skilled in the art motivated by the teaching of Yeol would have found it obvious to apply cleaning technique of Yeol while removing different types of contaminants from photomasks with the reasonable expectation of success.

13. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagamura in view of Eui-Yeol (U.S. 6,035,871).

Nagamura discloses the process identical to that as instantly claimed, and emphasizes that when the cathodic water is alkalized to maintain pH higher than 10, the effectiveness of removal of foreign matter is increased. This is clearly stated in col. 9, lines 10-15. Thus, Nagamura motivates a person skilled in the art to maintain pH of cathodic water at values of 10 and higher.

Eiu-Yeol discloses a process of cleaning, which can improve the yield of semiconductor devices (col. 2, lines 33-35). The cleaning of semiconductor devices in Eiu-Yeol is effected by a cathodic water (hydrogen dissolved in water). A pH-adjusting chemical fluid can be added to the hydrogenated water. By adding the pH-adjusting chemical fluid to the hydrogenated water, the pH of the hydrogenated water can be set to a proper value (e.g., not less than pH 7), so that a cleaning fluid with high efficiency of removing particles can be supplied to the treated substrate. The pH-adjusting chemical fluid to be added is preferably NH_4OH . Although, for example, NaOH , KOH , etc. can be used as the pH-adjusting chemical fluid (col.6, lines 37-49).

Therefore, a person skilled in the art motivated by suggestion of Nagamura and recognition of equivalency of KOH and NH_4OH for pH adjustment by Eiu-Yeol, would

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have found it obvious to utilize KOH in lieu of NH_4OH to enhance the effectiveness of particulate matter removal. Furthermore, in the instant case substitution of equivalent compounds requires no express motivation, as long as the prior art recognizes equivalency, *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. V. Linde Air products Co.* 85 USPQ 328 (USSC 1950).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (703) 305-0400. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872 9310 for regular communications and (703) 872 9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 2450.

Michael Kornakov
Examiner
Art Unit 1746

MK
November 1, 2002


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